

AMENDMENTS TO THE CLAIMS

Claims 1-17 (canceled)

Claim 18 (currently amended): A method of controlling an excimer laser unit to perform cornea ablation to reduce presbyopia, the comprising the step of:

- a) controlling said excimer laser unit to produce on the cornea a photoablative pattern inducing a fourth-order ocular aberration;
wherein said induced fourth-order aberration is a spherical aberration; and
wherein said step a) further comprises the steps of:
 - a1) acquiring and interpreting an aberrometric map of the eye indicating the visual defects of the eye, said visual defects comprising second-order visual defects including hypermetropia, astigmatism and myopia, and higher-order visual defects including spherical aberration;
 - a2) if the detected spherical aberration is negative, increasing it numerically in absolute value to obtain an overcorrect photoablative pattern inducing positive spherical aberration;
 - a3) if the detected spherical aberration is positive, changing its sign and increasing it numerically in absolute value to obtain an overcorrect photoablative pattern inducing positive spherical aberration; and
 - a4) supplying the photoablative pattern to said excimer laser unit for implementation on said cornea.

Claim 19 (canceled)

Claim 20 (currently amended): The control method as claimed in ~~Claim 19~~[[.]]

Claim 18:

wherein said induced spherical aberration is a positive spherical aberration.

Claim 21 (canceled)

Claim 22 (currently amended): The control method as claimed in Claim 18~~[[,]]~~;

wherein said step a) also comprises the step of:

- b) controlling said excimer laser unit to perform specific photoablative treatment related to the visual defect of the eye associated with the presbyopia.

Claim 23 (currently amended): The control method as claimed in Claim 22~~[[,]]~~;

wherein said step b) comprises the steps of:

- c) if the visual defect of the eye is hypermetropia, controlling said excimer laser unit to perform the following operations:
 - c1) ablation of a circular corona of maximum 6 mm inside diameter, maximum 9 mm outside diameter, and of such a depth as to compensate the spherical defect;
 - c2) ablation with a customized ablative pattern to eliminate higher than second-order defects, with reference to aberrometric data acquired prior to the operation in the preceding point; and
 - c3) if the above operations fail to achieve a coefficient of Zernike's polynomial Z_4^0 ranging between 0.1 and 1.0, ablation with a customized ablative pattern to obtain even greater spherical aberration;

- d) if the visual defect of the eye is hypermetropia and positive astigmatism or hypermetropia and negative astigmatism, controlling said excimer laser unit to perform the following operations:
 - d1) cylindrical ablation, with the excimer laser unit set solely to the cylindrical defect, to bring the cylindrical defect close to zero;
 - d2) ablation of a circular corona of maximum 6 mm inside diameter, maximum 9 mm outside diameter, and of such a depth as to compensate the spherical defect;
 - d3) ablation with a customized ablative pattern to eliminate higher than second-order defects, with reference to aberrometric data acquired prior to the operation in the preceding point; and
 - d4) if the above operations fail to achieve a coefficient of Zernike's polynomial Z_4^0 ranging between 0.1 and 1.0, ablation with a customized ablative pattern to obtain even greater spherical aberration;
- e) if the visual defect of the eye is myopia, controlling said excimer laser unit to perform the following operations:
 - e1) ablation to such a depth as to compensate the spherical defect; and
 - e2) ablation with a customized ablative pattern to induce positive spherical aberration with a coefficient of Zernike's polynomial Z_4^0 ranging between 0.1 and 1.0;
- f) if the visual defect of the eye is myopia and positive astigmatism or myopia and negative astigmatism, controlling said excimer laser unit to perform the following operations:
 - f1) cylindrical ablation, with the excimer laser unit set solely to the cylindrical defect, to bring the cylindrical defect close to zero;

- f2) ablation to such a depth as to compensate the spherical defect; and
- f3) ablation with a customized ablative pattern to induce positive spherical aberration with a coefficient of Zernike's polynomial Z_4^0 ranging between 0.1 and 1.0;
- g) if the visual defect of the eye is emmetropia, controlling said excimer laser unit to perform:
 - g1) operations d2), d3) and d4), if the visual defect improves using a positive lens; and
 - g2) operations e1) and e2), if the visual defect improves using a negative lens;
- h) if the visual defect of the eye is positive astigmatism or negative astigmatism, controlling said excimer laser unit to perform:
 - h1) operation d1) to achieve emmetropia;
 - h2) operations d2), d3) and d4), if the visual defect improves using a positive lens; and
 - h3) operations e1) and e2), if the visual defect improves using a negative lens.

Claim 24 (previously presented): The control method as claimed in Claim 18, also comprising the step of:

- i) controlling said excimer laser unit to form on the cornea a photoablative pattern which also corrects higher-order aberrations.

Claim 25 (currently amended): An excimer laser unit for performing cornea ablation to reduce presbyopia, comprising:

- a) first control means for controlling said excimer laser unit to form on the cornea a photoablative pattern inducing a fourth-order ocular aberration;

wherein said induced fourth-order aberration is a spherical aberration; and

wherein said first control means comprise:

- a1) aberrometric measuring means for acquiring and interpreting an aberrometric map of the eye indicating the visual defects of the eye, said visual defects comprising second-order visual defects including hypermetropia, astigmatism and myopia, and higher-order visual defects including spherical aberration;
- a2) first photoablative pattern generating means which are activated, if the detected spherical aberration is negative, to numerically increase in absolute value the spherical aberration detected by said aberrometric measuring means, and so generate a photoablative pattern inducing positive spherical aberration;
- a3) second photoablative pattern generating means which are activated, if the detected spherical aberration is positive, to change the sign of and numerically increase in absolute value the spherical aberration detected by said aberrometric measuring means, and so generate a photoablative pattern inducing positive spherical aberration;
- a4) supply means for supplying the photoablative pattern so generated to said excimer laser unit for implementation on said cornea.

Claim 26 (canceled)

Claim 27 (currently amended): The excimer laser unit as claimed in ~~Claim 26~~[[,]]

Claim 27:

wherein said induced spherical aberration is a positive spherical aberration.

Claim 28 (canceled)

Claim 29 (currently amended): The excimer laser unit as claimed in Claim 25~~[[,]]~~;
wherein said first control means control said excimer laser unit to perform a specific
photoablative treatment related to the visual defect of the eye associated with the
presbyopia.

Claim 30 (currently amended): The excimer laser unit as claimed in Claim 29~~[[,]]~~;
wherein said first control means:

- c) if the visual defect of the eye is hypermetropia, control said excimer laser unit to perform the following operations:
 - c1) ablation of a circular corona ~~of~~ with a maximum 6 mm inside diameter~~[[,]]~~ and a maximum 9 mm outside diameter, and of such a depth as to compensate the spherical defect;
 - c2) ablation with a customized ablative pattern to eliminate higher than second-order defects, with reference to aberrometric data acquired prior to the operation in the preceding point; and
 - c3) if the above operations fail to achieve a coefficient of Zernike's polynomial Z_4^0 ranging between 0.1 and 1.0, ablation with a customized ablative pattern to obtain even greater spherical aberration;
- d) if the visual defect of the eye is hypermetropia and positive astigmatism or hypermetropia and negative astigmatism, control said excimer laser unit to perform the following operations:

- d1) cylindrical ablation, with the excimer laser unit set solely to the cylindrical defect, to bring the cylindrical defect close to zero;
- d2) ablation of a circular corona of maximum 6 mm inside diameter, maximum 9 mm outside diameter, and of such a depth as to compensate the spherical defect;
- d3) ablation with a customized ablative pattern to eliminate higher than second-order defects, with reference to aberrometric data acquired prior to the operation in the preceding point; and
- d4) if the above operations fail to achieve a coefficient of Zernike's polynomial Z_4^0 ranging between 0.1 and 1.0, ablation with a customized ablative pattern to obtain even greater spherical aberration;
- e) if the visual defect of the eye is myopia, control said excimer laser unit to perform the following operations:
 - e1) ablation to such a depth as to compensate the spherical defect; and
 - e2) ablation with a customized ablative pattern to induce positive spherical aberration with a coefficient of Zernike's polynomial Z_4^0 ranging between 0.1 and 1.0;
- f) if the visual defect of the eye is myopia and positive astigmatism or myopia and negative astigmatism, control said excimer laser unit to perform the following operations:
 - f1) cylindrical ablation, with the excimer laser unit set solely to the cylindrical defect, to bring the cylindrical defect close to zero;
 - f2) ablation to such a depth as to compensate the spherical defect; and

- f3) ablation with a customized ablative pattern to induce positive spherical aberration with a coefficient of Zernike's polynomial Z_4^0 ranging between 0.1 and 1.0;
- g) if the visual defect of the eye is emmetropia, control said excimer laser unit to perform:
 - g1) operations d2), d3) and d4), if the visual defect improves using a positive lens; and
 - g2) operations e1) and e2), if the visual defect improves using a negative lens;
- h) if the visual defect of the eye is positive astigmatism or negative astigmatism, control said excimer laser unit to perform:
 - h1) operation d1) to achieve emmetropia;
 - h2) operations d2), d3) and d4), if the visual defect improves using a positive lens; and
 - h3) operations e1) and e2), if the visual defect improves using a negative lens.

Claim 31 (previously presented): The excimer laser unit as claimed in Claim 25, also comprising:

- i) second control means for controlling said excimer laser unit to form on the cornea a photoablative pattern which also corrects higher-order aberrations.

Claim 32 (temporarily withdrawn – currently amended): A method of reducing presbyopia, comprising the step of:

- ~~forming~~ forming on the cornea a photoablative pattern inducing a fourth-order ocular aberration.

Claim 33 (temporarily withdrawn – currently amended): The method as

claimed in Claim 32~~[[,]]~~;

wherein said fourth-order aberration is a spherical aberration.

Claim 34 (temporarily withdrawn – currently amended): The method as

claimed in Claim 33~~[[,]]~~;

wherein said spherical aberration is a positive spherical aberration.